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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/698,473

11/03/2003

Michio Kumazaki

3196

7590

06/27/2006

George A. Loud, Esquire
BACON & THOMAS
Fourth Floor
625 Slaters Lane
Alexandria, VA 22314-1176

EXAMINER

PATEL, RITA RAMESH

ART UNIT

PAPER NUMBER

1746

DATE MAILED: 06/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/698,473

Applicant(s)

KUMAZAKI, MICHIO

Examiner

Rita R. Patel

Art Unit

1746

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 November 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Priority

Acknowledgement has been made of applicant's claim for priority under 35 U.S.C. 119.

Drawings

The drawings received 11/3/03 are acceptable for examination purposes.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-8 are rejected under 35 U.S.C. 102(b) as being anticipated by Tomita et al. herein referred to as "Tomita", Publication No. JP2001053047A, however, a direct machine translation will be used for the purposes of making reference to Tomita.

Tomita teaches a semiconductor substrate cleaning apparatus and method are capable of efficiently removing contamination from both the obverse and reverse sides of a semiconductor substrate. The washing station of the semi-conductor substrate concerning this invention is characterized by coming to provide the penetrant remover supply nozzle which supplies a penetrant remover to front flesh-side both sides of the semi-conductor substrate used as the candidate for washing, and the ultrasonic vibrator which impresses a supersonic wave to front flesh-side both sides of said semi-

conductor substrate. Desirably, contact arrangement is carried out at said semi-conductor substrate, and an ultrasonic vibrator gives direct vibration to this semi-conductor substrate, and gives vibration through the protection member which is estranged to the semi-conductor substrate, and has been arranged at this semi-conductor substrate between said penetrant remover or said ultrasonic vibrator, and this semi-conductor substrate (Paragraphs [0012-0013]). Moreover, a maintenance fixture is made to hold and rotate this semi-conductor substrate by being pushed against the periphery edge of this semi-conductor substrate, and rotating in this washing station, and this maintenance fixture contains an ultrasonic vibrator in it (Paragraph [0014]).

Tomita's ultrasonic vibrator 6 reads on applicant's claim for an ultrasonic cleaner wherein the vibration-transmitting portion is formed at a front end of a horn of the vibration generator and has a slide-smoothing surface which is formed on a front end face of the horn, as seen in Figure 1(a) of Tomita. A penetrant remover 5 is supported to the wafer 1 through the ultrasonic oscillation nozzle 3 from the liquid inlet 4 (Paragraph [0036]). As denoted by the dashed lines in Figure 1(b), the cleaning-medium feed section assumes the form of a slit. Figures 1-2 of Tomita depict a wafer 1 adaptively contained within the cleaning apparatus by means of rollers 2 for being cleaned. Moreover, driving rollers 2 are removably attached to the wafer containing cleaning apparatus. Roll sponges 7a, 7b of Tomita read on applicant's claim of a tongue provided adjacent to the front end of the horn such that when the tongue is pressed against an object to be cleaned, the front end of the horn is caused to protrude from the slit; see Figures 13(a) and 13(b). Solution supply nozzles 8a, 8b are provided

to supply a chemical liquid to the central portion of each of the obverse and reverse sides of the wafer 1 (Paragraph [0062]).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tomita as applied to claim 1 above, and further in view of Andreas et al. herein referred to as "Andreas" (US Patent No. 6,269,511).

Tomita teaches the claimed invention, except fails to teach explicitly a brush implanted adjacent to the vibration-transmitting portion. However, Andreas teaches this feature as a known equivalent in the art. Andreas discloses an apparatus for submerged cleaning of substrates and the like which includes a container holding a bath of cleaning fluid with a submerged brush scrubber therein (Abstract). It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate this brush feature in Tomita, as taught by Andreas, for providing increased effectiveness and efficiency in cleaning by increasing the transfer efficiency of ultrasonic energy from the source to the fluid in said type of cleaning apparatus.

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tomita and Andreas as applied to claims 1 and 9 above, and further in view of Sorbo et al. herein referred to as "Sorbo" (Pub. No. US 2003/0062071A1).

Tomita and Andreas teach the claimed invention except fail to teach a load detector for detecting load imposed and an oscillator circuit for generating vibration on the basis of the detected load. Sorbo, nevertheless, teaches a cleaning system utilizing a pressurized dense-phase cleaning fluid which includes a cleaning containment vessel having a containment-vessel interior, and a pressurization source in fluid communication with the containment-vessel interior to produce a cleaning pressure therein. There is at least one ultrasonic energy source directing ultrasonic energy into the containment-vessel interior (Abstract). Also, Sorbo discloses a differential-pressure monitor 54 which may be provided to monitor the pressure difference between the containment vessel interior 26 and the transducer-housing interior 34. The differential-pressure monitor 54 may also serve as a feedback controller by using its output to control a regulator valve 56 and a bleed valve 58 so that the differential pressure is maintained; thus Sorbo reads on applicant's claim for a load detector and oscillator circuit. It would have been obvious to one of ordinary skill in the art at the time of the invention to impart said features to Tomita and Andreas to maintain appropriate pressure loads and control of the oscillating system, achieve service and cost efficiency, prevent operation at too low vibrational cleaning speeds and conversely prevent malfunction by operating at too high vibrational cleaning speeds.

Conclusion


The prior art made of record and not relied upon is considered pertinent to applicant's disclosure Tomita et al. (US Patent 6,543,080 B1). Similarly Tomita discloses in '080 a semiconductor substrate cleaning apparatus which houses a semiconductor for ultrasonic cleaning by means of a transducer and cleaning solution emitted by a nozzle.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rita R. Patel whose telephone number is (571) 272-8701. The examiner can normally be reached on M-F: 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Barr can be reached on (571) 272-1414. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

RRP



MICHAEL BARR
SUPERVISORY PATENT EXAMINER